

STATE OF ALASKA

Bill Sheffield, Governor

Annual Performance Report for
INTERIOR LANDLOCKED TROUT AND SALMON PROGRAM

by

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RESEARCH PROJECT SEGMENT

State: Alaska Name: Trout/Char Non-Anadromous Salmon
Project: F-10-1 Study Title: INTERIOR TROUT, SALMON,
AND WHITEFISH STUDIES
Study: T-8 Job Title: Interior Landlocked Trout
and Salmon Program
Job: T-8-1
Cooperators: Michael Doxey, Jerome Hallberg,
and Richard Peckham
Period Covered: July 1, 1984 to June 30, 1985

ABSTRACT

A creel census conducted on Chena Lakes in 1985 revealed that an estimated 14,183 angler hours of effort were expended to harvest an estimated 11,632 rainbow trout, *Salmo gairdneri* Richardson, and 9,882 coho salmon, *Oncorhynchus kisutch* (Walbaum), representing a total harvest of 21,518 fish. Catch rate was 1.51 fish per hour. Data presented suggest that rainbow trout stocked as fingerling do not enter the creel for two complete years after stocking. Subcatchable-size rainbow grow to catchable size (180 mm F.L.) by the end of the first summer. Coho salmon stocked as fingerlings enter the creel the second summer after stocking.

A fall population estimate in Birch Lake indicated an estimated survival to catchable size of 1.47 percent of the 270,000 rainbow trout fingerlings stocked in 1984. Creel census data indicated a major contribution to the creel from cohos stocked in 1984 and poor returns for rainbows.

Results are presented for test netting and creel census on Quartz Lake and for test netting on selected smaller lakes.

KEY WORDS

Chena Lakes, creel census, Birch Lake, Quartz Lake, Interior stocked lakes, rainbow trout, coho salmon and chinook salmon.

BACKGROUND

Table 1 lists all species mentioned in this report.

Birch Lake

Birch Lake has 803 surface acres and is located 56 miles southeast of Fairbanks on the Richardson Highway. The maximal depth of its lightly brown-stained waters is 49 ft.

The U.S. Air Force maintains a recreation camp on Birch Lake. Heavy summer use of this camp contributes significantly to angler pressure. There is a state parking and boat launching area along the eastern shoreline, and a turn off and parking area where the highway passes the south end of the lake. About half the lake's shoreline consists of private land with cabins. The lake has four small inlets and one outlet that has a structure to control fish and water levels.

Chemical rehabilitation in 1966 removed humpback whitefish, least cisco, burbot, slimy sculpin, and stunted northern pike. Fingerling rainbow trout were subsequently stocked. Since that time, a popular summer and winter sport fishery has been maintained by stockings of rainbow trout and coho salmon fingerlings and subcatchable rainbow trout.

Lake chubs and slimy sculpins have appeared in the lake, probably because of the vandalization of the outlet structure in 1967. The chubs have attained such a high population level that they compete with stocked game fish for both space and food.

Chena Lakes

Chena Lakes was created when the U.S. Army Corps of Engineers restored a group of central borrow pits to form a 259-acre lake near the control structure at the Chena River Lakes Flood Control Project; its maximum depth is 38 feet. The Alaska Department of Fish and Game (ADF&G), Sport Fish Division worked closely with the Corps during construction of the lake to assure proper physical characteristics so that the lake could sustain a year-round fish population. The lake is located in the North Pole area (between Fort Wainwright and Eielson Air Force Base) and is about a 25-minute drive from Fairbanks. It is a major North Star Borough recreation area. After chemical rehabilitation in 1981 to remove undesirable fish species, the lake was stocked with rainbow trout and coho salmon. Subsequent stockings have maintained a popular and intensive sport fishery.

Quartz Lake

Quartz Lake is a 1,500-acre lake located near the Richardson Highway, 16 miles north of Delta Junction; maximum depth is 40 feet. The lake was rehabilitated in 1970 with powdered rotenone to eliminate stunted northern pike and least cisco. Rainbow trout have been stocked annually since rehabilitation, except in 1978 and 1981 when none were available. Coho salmon have been stocked each year since 1977, except 1980 and 1982.

The result has been a highly popular year-round sport fishery.

Table 1. Scientific and common names of fish mentioned in this report.

Common Name	Scientific Name	Abbreviation
Burbot	<i>Lota Lota</i> (Linnaeus)	BB
Chinook salmon	<i>Oncorhynchus tshawytscha</i> (Walbaum)	KS
Coho salmon	<i>Oncorhynchus kisutch</i> (Walbaum)	SS
Humpback whitefish	<i>Coregonus pidschian</i> (Gmelin)	HWF
Lake chub	<i>Couesius plumbeus</i> (Agassiz)	LC
Lake trout	<i>Salvelinus namaycush</i> (Walbaum)	LT
Least cisco	<i>Coregonus sardinella</i> (Valenciennes)	LCI
Longnose sucker	<i>Catostomus catostomus</i> Forster	LNS
Northern pike	<i>Esox lucius</i> Linnaeus	NP
Rainbow trout	<i>Salmo gairdneri</i> Richardson	RT
Round whitefish	<i>Prosopium cylindraceum</i> (Pallas)	RWF
Slimy sculpin	<i>Cottus cognatus</i> Richardson	SSC

Other Lakes

Approximately 55 other lakes and ponds in the Tanana River drainage are stocked with rainbow trout, coho and chinook salmon, sheefish, and grayling. These are primarily on or within a short distance of the road system. A few lakes are accessible by winter trail and/or airplane.

RECOMMENDATIONS

Research

1. That evaluation of Birch, Chena, and Quartz Lakes continue comparing angler success and growth rate of fish at continuous successive stable stocking levels.
2. That chinook salmon stocked into Little Harding Lake and selected lakes on Fort Greely be evaluated in terms of growth, angling potential, and life span.
3. That Arctic char be stocked into "Trap Lake" (a remote lake in the Kantishna Drainage) and evaluations of survival and growth begin.

Management

1. That creel censuses continue on Chena Lakes, Birch Lake, and Quartz Lake to obtain estimates of effort, harvest, and catch per unit of effort (CPUE) data.
2. That test netting be conducted to obtain growth and survival data so that ADF&G staff and anglers can be informed of the fishing potential at Chena Lakes, Birch Lake, Quartz Lake, and other stocked lakes.
3. That 50,000 subcatchable rainbow trout (20 g/ea) and 30,000 coho salmon (2 g/ea) be stocked into Birch Lake in spring of 1987.
4. That the stocking programs at Chena and Quartz Lakes be maintained at their present level.

OBJECTIVES

A. Chena Lake

1. To stock 15,000 catchable rainbow trout (mean wt. = 80 g) into Chena Lakes immediately after breakup in 1985 (May) and 15,000 catchable rainbow trout in mid-July, 1985.
2. To stock 30,000 coho salmon at a size of 2.3 - 3.0 g immediately after breakup in 1985.

3. To monitor condition factor of stocked catchable rainbow trout, and condition factor and growth rate to catchable size of stocked coho salmon.
4. To conduct a statistical creel census program that will produce estimates of angler effort, CPUE, and total harvest.
5. To estimate, from data gathered during the creel census, the proportional contribution of various stocking classes of the two species to the fishery, with emphasis on the stocking classes comprising the majority of the fishery.
6. To utilize the data gathered during the study and to gather such other information as is necessary in order to provide timely information to the staff and public on angling potential and fishing conditions at Chena Lakes.

B. Birch Lake

1. To stock 50,000 coho salmon at 3 g immediately after breakup in 1985 (late May or early June). The rainbow trout fishery will be maintained by the stocking of a maximum of 75,000 sub-catchables at 20 g in the spring of 1986.
2. To estimate the survival to catchable size of Swanson strain fingerlings stocked in 1984 to finalize the stocking recommendation for 1986 subcatchables, and to estimate survival to catchable size of the coho salmon stocked in early summer, 1985.
3. To monitor condition factor and growth rate to catchable size of stocked rainbow trout and coho salmon.
4. To maintain a scheduled, stratified summer creel census which will provide information on catch composition by species and stocking class, and overall CPUE.
5. To maintain an unscheduled stratified winter creel census that will monitor angler use and catch trends, and to attempt to develop a sampling design that provides statistically valid estimates of CPUE and catch composition within the winter weather and manpower constraints.
6. To utilize the data gathered during the study and to gather such other information as is necessary to provide timely information to the staff and public on angling potential and fishing conditions at Birch Lake.
7. To maintain the Birch Lake weir (located at the lake outlet) to hold the lake water level at a point between

1½ and 7 inches below the legal water mark, and to keep flow shut down as much as possible to minimize attraction to stocked fish.

C. Quartz Lake

1. To stock coho salmon at 3.0 g immediately after breakup in 1985 (late May or early June) and to evaluate their survival to catchable size. The rainbow trout fishery will be maintained by the stocking of Swanson rainbow trout at 2.3 g in July, 1985 (these fish will likely reach a catchable size by mid-summer or fall 1986).
2. To monitor condition factor and growth rate to catchable size of rainbow trout stocked in 1984 and coho salmon stocked in early summer 1985.
3. To maintain a scheduled stratified summer creel census that will provide information on catch composition by species and stocking class and CPUE.
4. To maintain an unscheduled stratified winter creel census that will monitor angler use and catch trends, and to attempt to develop a sampling design that provides statistically valid estimates of CPUE and catch composition within the winter weather and manpower constraints.
5. To utilize the data gathered during the study and to gather other information as necessary to provide timely information to the staff and public on angling potential and fishing conditions at Quartz Lake.

D. Other Lakes

1. To stock a total of 25 smaller road system and remote lakes with a total of 130,000 rainbow trout, coho salmon, and chinook salmon.
2. To conduct cursory evaluations of the success of previous stockings and of the sport angling potential for a total of 17 of the smaller roadside and remote lakes stocked with the above species.
3. To conduct in-depth studies of Jan, Donna, Little Donna, and Forrest Lakes in conjunction with the statewide stocked rainbow trout research program.
4. To utilize the data gathered during the course of the studies and to gather other information to provide timely information to the staff and public on angling potential and fishing conditions at the stocked lakes.

TECHNIQUES

Multifilament and monofilament graduated-mesh sinking or floating gill nets, measuring 125 x 6 ft and consisting of five 25-ft panels of 1/2-in through 2 1/2-in bar mesh, were used to capture fish.

All fish samples were grouped by data and location. Weights were recorded to the nearest gram, using a Chatillon spring scale or a triple-beam balance. Fork lengths were measured to the nearest millimeter, and sex and stage of maturity were determined by examining gonads.

Chena Lakes Creel Census Design

Effort was estimated to $\pm 8\%$ (90% confidence interval), using a two-stage stratified sampling design. Days are the first-stage sample units and hours are the second-stage units. Based on previously collected data a total of 56 counts per month are required to provide an estimate at the desired precision. CPUE with 90% confidence interval of $\pm 18\%$ of the mean CPUE (± 0.26 fish/h) will be estimated from a total of a minimum of 390 interviews through the course of the summer.

The proportion of coho salmon stocked as fingerlings in 1984, rainbow trout stocked as fingerlings in 1984, rainbow trout stocked as catchables in 1985, old coho salmon, and old rainbow trout in the creel was determined by examining a total of 455 randomly selected fish for length through the course of the summer.

Effort and CPUE data combined gave an estimate of total harvest with a 90% confidence interval of $\pm 19\%$. CPUE data will be based on individual completed trip interviews.

Birch Lake Population Study

The rainbow trout population estimate was accomplished by capturing fish in fyke nets, marking them with caudal fin clips, and releasing them away from the traps. Different fin clips were used on opposite sides of the lake, and the numbers of fish that crossed over were monitored to determine the degree of mixing.

FINDINGS

Stocking

Chena Lakes was stocked three times in 1985. A total of 30,000 cohos at 120/lb (3.4 g/ea) was stocked on 30 May. The fish were provided in good condition by the Clear Hatchery, and mortality was minimal. A total of 30,000 large subcatchable rainbow trout was stocked in two increments of 15,000 fish in early June and in mid-July. These fish were stocked at 8/lb (56 g) and 9/lb (44 g), respectively, and mortality was minimal.

Creel Census

The 1985 creel census program designed to monitor the summer rainbow and coho salmon fishery in Chena Lakes began on 1 June and continued until 31 August. The lake usually is fishable by the last week in May; however, Chena Lakes was not completely ice-free until 30 May 1985.

Results of the 92 day creel census appear in Table 2. During this period, a calculated 14,183 angler hours were expended to harvest 11,632 rainbow trout and 9,882 coho salmon, or a total combined harvest of 21,514 fish. The average CPUE for the three months was 1.51 fish/h. The 1985 totals are very similar to those obtained in the 1984 creel survey, which was the first year a creel census was done there. Angler hours increased 8% from 13.035 hours in 1984 to 14.183 hours in 1985, while the harvest dropped slightly (less than 2%) and the CPUE fell from 1.67 to 1.51. The summary of the 1984 and 1985 creel census appear in Table 3.

Fishing pressure in 1985 was the heaviest in July, accounting for 47% of the summer effort and 54% of the total harvest. In 1984 angler pressure was greatest during 26 May-30 June, accounting for 60% of the effort and 64% of the harvest (Hallberg 1985). Hallberg speculated that the heavy effort and harvest that accrued in June 1984 was due to the "grand-opening-day effect" that brought more than 6,000 people out to the area. Also extremely pleasant weather prevailed throughout June 1984. In 1985 the good weather appeared in July; during June and August, considerable rainfall occurred.

Contribution of Various Stocking Classes

During the 1985 creel census at Chena Lakes, a total of 455 fish from the angler creels was identified and measured. Of this sample, 215 were coho salmon whose fork lengths ranged from 149 to 214 mm (a mean of 193 mm). These fish represent the combination of cohos stocked in 1982, whose fork lengths averaged 207 mm in August 1984 (Hallberg 1985), and 1984, whose fork lengths in May and August 1985 averaged 128 mm and 152 mm, respectively. Test netting in Late August 1985 produced a sample of 6 cohos from the 1985 stocking that averaged 110 mm.

A total of 240 rainbow trout accounted for the remainder of those fish sampled from the creel. Within this sample were two distinct size groups of rainbows. The first group of 43 fish ranged in length from 126 to 172 mm, with a mean of 149 mm. It took 2 years for these fish to enter the fishery, and they were still considered too small to be kept by most anglers.

A second fingerling stocking occurred in July 1984. Test netting in May 1985 showed that these fingerlings (sample size = 63) averaged 114 mm; by August 1985 they averaged 127 mm.

The second size group of rainbow trout in the 1985 creel were comprised of the 197 larger-size fish. These rainbows ranged in fork length from 165 to 253 mm, with a mean fork length of 203 mm. The majority of these fish are considered to be the result of the May 1984 stocking of 18,000

Table 2. Creel census results of the landlocked rainbow trout and coho salmon fishery in Chena Lakes, June through August 1985.

Month	Angler Hours			Harvest			CPUE
	Weekdays	Weekends	Total	RBT	SS	Total	RBT & SS/Hr
June 1 - 30	1,810	2,920	4,730	3,558	2,142	5,700	1.3
July 1 - 31	4,301	2,337	6,638	5,131	6,425	11,556	1.8
Aug. 1 - 31	<u>1,773</u>	<u>1,042</u>	<u>2,815</u>	<u>2,943</u>	<u>1,319</u>	<u>4,262</u>	<u>1.4</u>
Totals	7,884	6,299	14,183 ¹	11,632	9,886	21,518 ²	1.51 ³

¹ 90% CI \pm 8% = 1,119

² 90% CI \pm 19% = 4,155

³ 90% CI \pm 18% = .26

Table 3. Summary of creel census results for Chena Lakes, 1984-1985.

Year	Dates	Days	Total Angler Hours	Harvest		Total Harvest	CPUE
				RBT	SS		
1984	May 26-Aug. 31	98	13,035	12,930	8,849	21,779	1.67
1985	June 1-Aug. 31	92	14,183	11,632	9,886	21,518	1.51

subcatchable-size fish (132-mm mean FL at time of stocking). By August 1984 (3 months after stocking) these fish averaged 170 mm, and the test-netting results in May 1985 indicated an average of 216 mm. Also contributing to the larger-size rainbows in the 1985 summer creel were those subcatchable-size fish that were stocked in early June at 173 mm and in mid-July at 165 mm.

Condition Factors

Fork lengths and weights were collected from a subsample of rainbow trout and coho salmon at time of stocking. Similar data were obtained from test-netting results in Chena Lakes in June and August 1985. Condition factors were calculated, and data were stored on a micro-computer memory disk where it will be used for comparison of future stockings in Chena and other area lakes.

Birch Lake

Stocking:

Birch Lake was stocked on 30 May 1985 with 55,539 coho salmon at 125/lb (3.4 g/ea). The fish were provided by the Clear Hatchery and were in excellent condition; few mortalities were observed. Nearshore surface water temperature was 5.5°C. No rainbow trout were stocked into Birch Lake in 1985. The 1985 brood year rainbow trout destined for Birch Lake were retained in the Clear Hatchery to be reared through the winter and stocked as 20/lb yearlings after breakup in 1986. These fish should enter the fishery as soon as, and exhibit much higher survival than, an August, 1985 fingerling stocking would have (Doxey 1985).

Creel Census:

Birch Lake froze up on 21 October 1984, and by 3 November the winter sport fishery was underway. The 1984-1985 winter creel census ran from 4 November 1984 to 21 April 1985; no scheduled creel census was undertaken between 3 February and 21 April, because of low angler use caused by heavy snowfall and overflow and because other tasks were given higher priority. Creel surveys were performed seven times during the winter. A total of 160 anglers was interviewed; they had caught 364 fish for an overall CPUE of 0.88 fish/h.

Catch composition was as follows: (1) rainbow trout stocked prior to 1983, 11.81%; (2) rainbow trout stocked in 1983, 10.71%; and (3) coho salmon stocked in 1984, 77.48%. The 1984 cohos supported the winter fishery because they had reached catchable size by October and rainbow trout numbers were low (Doxey 1985).

Analysis of previous winter's creel census data by regional project leaders has enabled them to formulate a creel census program for Birch, Chena, and Quartz Lakes for winter 1986-87.

The ice broke up on Birch Lake on 29 May 1985, and the summer creel census was conducted between 8 June and 20 August. During 22 creel census periods, a total of 223 anglers was interviewed. They had taken

92 fish during 338 hours of fishing, for an overall CPUE of 0.28 fish/h (90% CI=0.37 to 0.14 fish/h). Rainbow trout CPUE was 0.16 fish/h (90% CI =0.23 to 0.09 fish/h). This was the lowest summer CPUE for rainbow trout recorded in the seven years that I have conducted the study (Table 4). Catch composition in 1985 was as follows: (1) Cohos stocked as fingerlings in 1984, 42%; (2) rainbow trout stocked prior to 1984, 33%; and (3) rainbow trout stocked in 1984, 25%.

Survival Estimate:

A Schnabel population estimate of the rainbow trout that survived from stocking as fingerlings in July 1984 to the fall of 1985 was performed in late September and early October. Because of length-range overlapping between the target age-1 rainbow trout and the age-2 rainbows stocked as fingerlings in 1983, an arbitrary length of 215 mm was designated as the cut-off length for the estimate: fish larger than 215 mm were not marked. All trout captured were counted; and records were kept of the number of fish over 215 mm taken, the number less than 215 mm taken, and the number marked. Lengths were measured and scales collected from a subsample of the population for later analysis and application to the estimate. Fyke nets were the primary method of capture. Night electrofishing and seining were abandoned as unproductive.

During the 5-day course of the estimate, 1,233 trout were marked with caudal fin clips. The crossover rates (as determined by giving different marks on opposite sides of the lake) were 45% and 54% on the last two days of the estimate, indicating excellent mixing of marked and unmarked fish. A total of 1,564 fish was examined for marks during the course of the estimate. The estimated number of rainbow trout in Birch Lake with fork lengths of 215 mm or less was 4,504 (95% C I 5,021 to 4,040). The proportion of fish over 215 mm ranged from 30.36% to 41.81% per day, with a mean of 34.4% for the 3,053 fish separated into the two length groups during the 5 days. Assuming that this is representative of the overall trout population, this percentage applied to the estimate produces a total estimate of 6,865 trout in the lake (95% C I 7,653 to 6,158). Age analysis of a sample of 62 trout (31 over 215 mm and 31 at 215 mm or less) indicated that the length range at which there was overlapping between age classes was from 185 mm to 227 mm. Within that overlap, 44% of the fish from 216 mm to 227 mm were age 1, and 35% of the fish from 185 mm to 215 mm were age 2 and older. Applying those percentages to the population structure (represented by a random sample of 100 trout lengths), a total of 3,971 age-1 rainbow trout and 2,894 age-2 or older fish were present in the lake. A total of 74% of the yearlings was 180 mm (catchable size) or larger. The age-1 estimate represents a survival of 1.47% of the 270,000 fingerlings stocked in 1984.

Monitoring Growth and Condition Factors:

Growth to catchable size of cohos stocked in June 1985 was monitored by obtaining length data from fish captured with fyke nets in July, August, and October. Sample sizes declined because of decreasing fyke-net

Table 4. Catch per unit effort (CPUE) of 1979-1985 summer fisheries for Birch Lake rainbow trout.

Dates	CPUE (Fish/hr)
May 27 - Sept. 3, 1979	0.27
May 19 - Sept. 1, 1980	0.34
May 11 - Aug. 30, 1981	0.55
May 28 - Aug. 29, 1982	0.46
May 19 - Aug. 31, 1983	0.53
May 20 - Aug. 31, 1984	0.28
June 6 - Aug. 20, 1985	0.16

catches. Table 5 gives the results of Birch Lake coho sampling. By October, 68% of the cohos were 180 mm (catchable size) or larger. The mean length of a sample of 37 fish was 188 mm.

Similar sampling was done on rainbow trout. Because of the overlapping in length ranges between the larger specimens of the 1984 fingerling plant and older age classes, the percentage of catchable fish in the entire population was used to illustrate the recruitment of age-1 trout into the catchable population. The percentage of catchable trout in the population increased from 22% in July to 85% in October (Table 6).

Birch Lake Weir:

Major repairs to the Birch Lake weir were needed in August 1985. In late July it became apparent that the rubber skirts that prevented fish passage under the rotating screens were deteriorating, and small rainbow trout and coho salmon were escaping down the outlet. The outlet flow was stopped, a truck crane was brought in to lift the screen assemblies, and all the rubber skirts were replaced. Several hundred age-1 rainbows were observed dead in the stream below the weir.

The lake level was maintained between specified limits throughout the summer by operation of the weir.

Quartz Lake

Stocking:

Quartz Lake was stocked in late May with 150,000 cohos at 125/lb. The fish were provided by Clear Hatchery and were in excellent condition; few mortalities were noted. The first stocking of rainbow trout took place in late July, when 100,000 fingerlings from the Elmendorf hatchery were stocked. These fish were small (490/lb, compared with the requested 200/lb fingerlings), and a high mortality occurred at stocking. Staff members who assisted with the stocking estimated an immediate mortality of 30,000 fish. The probability of further mortalities creates the potential for little recruitment to the catchable population of rainbow trout from this stocking. In late August, 287,000 rainbow trout fingerlings at 256/lb to 284/lb were stocked. Mortality was low for these fish that were provided by the Clear Hatchery.

Creel census:

The Quartz Lake winter creel census began on 18 November 1984 and ended on 4 May 1985. A total of 229 anglers was interviewed. They had fished for 623 h to catch 401 coho salmon and 63 rainbow trout, for a CPUE of 0.64 fish per hour. While this is lower than that reported for Birch Lake, it is probably more representative of the situation in a stocked lake, since it encompasses the period in late winter when fishing is normally slow.

Table 5. Growth information for coho salmon stocked into Birch Lake
in June 1985.

Date	n	\bar{x} Length (mm)	Length Range (mm)	Catchable (%)	90% CI
7/11/85	58	120	98-135	0	± 0
8/28/85	27	152	110-182	7	± 9
10/8/85	37	188	136-219	68	± 15

Table 6. Growth information for the Birch Lake rainbow trout population.

Date	n	\bar{x} Length (mm)	Length Range (mm)	Catchable (%)	90% CI
7/11/85	117	171	95-368	22	± 13
8/28/85	114	207	101-454	61	± 10
10/8/85	100	203	126-400	85	± 6

The Quartz Lake summer creel census was taken from 8 June through 1 September 1985. A total of 573 anglers spent 1,640 man-hours to catch 237 rainbow trout and 947 coho salmon, for an overall CPUE of 0.72 fish/h. CPUE for rainbows was 0.14 fish/h (± 0.03 at 90% CI); CPUE for cohos was 0.58 fish/h (90% CI ± 0.08 fish/h).

Catch composition follows:

Cohos -	Age I	= 78% ($\pm 3\%$ @ 90% CI)
	Age II & Older	= 22% ($\pm 6\%$ @ 90% CI)
Rainbows -	Age I	= 17% ($\pm 10\%$ @ 90% CI)
	Age II & Older	= 83% ($\pm 4\%$ @ 90% CI)

Growth:

Tables 7 and 8 detail results of length samples taken from Quartz Lake cohos stocked in 1985 and rainbows stocked in 1984. These stocking classes were sampled twice (6/26/85 and 8/1/85). Fifteen percent of the 1984 rainbow trout were 180 mm or larger (catchable size) by early August.

Small Lake Stocking

A total of 28 smaller Tanana drainage lakes was stocked with 191,560 rainbow trout, coho salmon, and chinook salmon. Table 9 breaks down the totals.

Small Lake Sampling

Delta area:

A total of 12 Delta area stocked lakes was sampled from 29 August to 21 September, utilizing experimental gill nets and sport fishing gear to estimate size composition of the various stocking classes. Results are summarized in Table 10. Overnight gill-net sets were made in Quartz and Four Mile Lakes, while sets (ranging from 1 to 5 hours) in the other lakes occurred during daytime.

Age-0 king salmon stocked in Mark, North Twin, and Weasel Lakes on 18 June at a size of 23/lb ranged from 177 to 203 mm when sampled in early September. The highest catch rate was for age-2 rainbow trout in Little Donna Lake. Capture rate by gill net was 14.84 fish/h while the rate with sport fishing gear was 10.00 fish/h. Twenty-six fish sampled had a mean length of 294 mm. The gill-net catch rate in Donna Lake for age-2 rainbow trout was 10.18 fish/h; however, these fish were smaller (a mean length of 254 mm). Age-2 rainbow trout in Bluff Cabin, Rainbow, and Robertson #2 Lakes had mean lengths of 365 mm, 301 mm, and 314 mm, respectively.

A sample of six age-3 rainbow trout from the first plant in Monte Lake (September 1982) are doing well. The fish were robust and had a mean length of 400 mm.

Table 7. Growth information for Quartz Lake cohos stocked in 1985.

Date	n	Length Range (mm)	\bar{x} Length (mm)
6/26/85	161	69-124	93
8/01/85	225	83-146	129

Table 8. Growth information for Quartz Lake rainbows stocked in 1984.

Date	n	Length Range (mm)	\bar{x} Length (mm)
6/26/85	163	91-175	122
8/01/85	85	106-225	155

Table 9. Species breakdown for small lakes stockings.

Species	Number of Lakes	Number Stocked
Rainbow Trout	10	139,700
Coho Salmon	10	38,461
Chinook Salmon	8	13,400

Table 10. Population characteristics of stocked lakes determined by graduated-mesh gill nets and sport fishing gear, Delta area 1985.

Lake	Date Sampled	Species	No. Captured	Capture Method	Age Class	Length (mm)		Freq.**	Date Stocked	Total Number	No./ lb.	No./ acre	Source
						Range	Mean						
Bluff Cabin	8/30	RT	10	GN*	II	300-408	365	4.12	9/14/83	10,000	293	200	Swanson
		RT	4	SF	II			0.67					
Donna	8/29	RT	28	GN	II	224-293	254	10.18	9/14/83	15,900	293	274	Swanson
	9/12	RT	10	GN	I	164-247	204	1.90	8/16/84	25,400	214	254	Swanson
Four Mile		RT	96	OGN	I			2.53					
		RT	1	GN	III	397-470	430	0.59	9/01/82	25,700	315	257	Swanson
		RT	6	OGN	III			0.16					
		SF	10	OGN	I	232-290	260	0.26	8/13/84	3,000		30	
Lisa	8/29	SF	4	OGN		543-629	584	0.11					
		SS	1	GN	0+	124-160	143	0.23	5/30/85	10,000	124	200	Wood Cr.
		SS	5	SF	0+			1.52					
		SS	6	GN	III	253-285	266	1.40	6/17/82	8,500	224	170	Seward
		SS	9	SF	III			2.73					
		RT	6	GN	I	162-204	184	1.40	8/16/84	9,000	214	180	Swanson
Little Donna	8/29	RT	16	GN	II	224-332	294	14.84	9/14/83	12,500	293	266	Swanson
		RT	10	SF	II			10.00					
Mark	9/3	RT	5	GN	III	304-435	357	2.50	9/16/82	8,000	140	400	Swanson
		KS	3	GN	0+	179-191	187	1.50	6/18/85	1,000	23	50	Crooked Cr.
Monte	9/5	KS	4	SF	0+			2.00					
		RT	6	GN	III	374-455	400	3.28	9/1/82	30,000	315	168	Swanson
North Twin	9/3	RT	2	GN	III	442-451	447	1.00	9/16/82	6,000	140	261	Swanson
		RT	1	SF	II	216		0.67	9/14/83	4,000	293	174	Swanson
		KS	1	GN	0+	177		0.50	6/18/85	1,000	23	43	Crooked Cr.

(continued)

Table 10. (Cont'd) Population characteristics of stocked lakes determined by graduated-mesh gill nets and sport fishing gear, Delta area 1985.

Lake	Date Sampled	Species	No. Captured	Capture Method	Age Class	Length (mm)		Freq.**	Date Stocked	Total Number	No./ lb.	No./ acre	Source
						Range	Mean						
Quartz	9/21	RT	1	OGN	II	358		0.05	8/29/83	233,300	348	156	Swanson
		RT	12	OGN	I	215-259	234	0.60	8/21/84	273,500	216	182	Swanson
		SS	7	OGN	I	198-237	221	0.35	5/30/84	155,750	105-246	103	Seward & Wood River Swanson
Rainbow	9/5	RT	11	GN	II	273-380	301	7.33	9/14/83	24,000	293	250	Swanson
Robertson #2	8/28	RT	3	SF	II			1.20					
		RT	1	SF	VI	424		0.33	9/18/79	2,450	203	306	Talarik
		RT	4	SF	II	239-351	314	1.33	9/14/83	1,435	293	179	Swanson
Weasel	9/4	RT	6	GN	II			3.0					
		RT	1	GN	0+	178		0.50	6/18/85				Must have been in with KS plant
		KS	4	GN	0+	195-203	200	2.00	6/18/85	500	23	63	Crooked Cr.

* GN = Daytime gill net set, usually 1 to 5 hours.
 SF = Sport fishing gear
 OGN = Overnight gill net set

** Frequency = fish per hour.

Fairbanks Area

Dune Lake:

Dune Lake was test netted on 11 September. One 125-foot graduated-mesh gill net was fished for 4 hours. Two rainbow trout were caught in the net. They had 318 and 283 mm fork lengths and weighed 485 and 342 g, respectively. These rainbows were part of an experimental stocking of 2,500 fingerlings in August 1984. Dune Lake has been stocked with grayling on several occasions since 1976. Grayling were originally chosen because of their ability to withstand low oxygen levels that Dune is known to have. However, the presence of rainbows there in 1985 verifies some survival of the 1984 stocking. More interesting is the phenomenal growth these fish achieved in one year's time. They averaged 300 mm, which from a small sample of only two fish may not represent the population; but it still represents growth rates greater than any other of the Interior's stocked lakes.

Little Harding Lake:

On 12 June 1985 a total of 10,295 chinook salmon was stocked into Little Harding Lake. The fish were provided by the Elmendorf Hatchery in excellent condition, and stocking mortality was minimal. By October a few were trying to migrate downstream in the outlet and dying against the culvert screens. Cohos have not been observed attempting fall outmigrations in Little Harding or Birch Lakes. From freeze-up in late October through midwinter, chinook salmon having 100-150 mm fork lengths bit voraciously when anglers fished through the ice. Most of these fish were released. Cohos (ranging in length from 180 to 250 mm) were available to anglers, but effort was light.

Spencer Lake:

The age-2 rainbow trout in Spencer Lake were sampled by angling on 28 November 1985. A bag limit of 10 fish was taken during 50 minutes of ice fishing. Length range was 200-261 mm; the mean length was 225 mm. The mean length of this stocking class was 189 mm in December 1984. Based on this information, Spencer Lake was added to the list of stocked lakes providing public angling opportunity, and sport fishermen began utilizing it.

Geskakmina Lake:

Geskakmina Lake was fished for 4 hours on 11 September with a single 125' graduated-mesh gill net; however, no fish were caught. Reports from interior fisherman indicated that fish have been taken here in both the summer and winter (Jerry Hallberg, pers. comm.). Rainbow trout fingerlings were stocked in 1983 and 1984; coho salmon fingerlings were stocked in 1985. It is recommended that more test netting be done to document survival and obtain an estimate of growth. A total of four hours test netting per year is not sufficient.

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